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ABSTRACT

This paper describes the first phase of a project that applies multimedia and hypermedia technology to the study of modern languages. The approach differs from taditional ones in that language is not viewed from a conversational or grammatical perspective but through scenarios imitating the contexts of natural language use. In this phase, the approach is used to teach Italian through the substantive context of the Italian economy. The paper describes Interactive Tutoring Encyclopedia based on Multimedia (ITEM), a multimedia and hypermedia application implemented in Loco, under UNIX, actually existing as a prototype in ToolBook, running under MS-Windows. ITEM focuses on Italian economy since unification of the country and fosters a discussion on how political structures, traditions, and ways of thinking affect Italian economic life. Types of economic activities, state and private roles in the economy and company structures, definitions, organizations, and functions are desribed. ITEM is being designed to achieve three main goals: serve as an instructional aid for teachers of courses covering both Italian language and basic Italian economy; provide a self-directed learning environment for students; and supply professionals with a research tool. Contains six references. (AA/MSE)

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A Multimedia Program Combining Special Purposes Italian with the Study of the Italian Economy

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Abstract

The paper describes the first phase of a wider project which aims at applying multimedia technology to the study of modern languages. This approach differs from the traditional ones in what languages are no longer tackled in a conversation-centered, grammar-oriented way, but via a scenario-based design. Scenarios provide an integration of task analysis and design envisionment. This means that users are involved in a mimetic context, that they are engaged in an action requiring from them the use of a language different from their mother tongue. It is not merely passive language learning. The central hypothesis is to learn-by-doing, to create a sort of artificial microworld where users can experience language learning in the same way as it typically occurs in natural settings, where they can manipulate pieces of the larger whole in order to master them. The *whole* that has been chosen in this first phase is Italian economy. The reason for such a choice is that we see the advantage of the approach we propose in

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those emerging university curricula where language training is applied to the study of a more professional subject, normally economy or law.

The application in question, ITEM, takes the form of a graph-based hypermedia system. It covers a corpus of materials related to the Italian economic world, which includes texts, images, tools for using them, like tools for navigation. Structured data include HTML texts, relational tables for catalogues and the encyclopaedia, Postscript drawings and TIFF images.

The ITEM data cycle covers data acquisition and storing, data organization, data linking, and data presentation via the UNIX front-end.

1 Introduction

All over the world managers, these days, have to conduct business across national borders, languages, and cultures. But many of them still lack any formal training in country specific business and cross-cultural understanding. Communication has then to go beyond cultural and linguistic barriers if it has to be effective.

What we propose is therefore an approach to an advanced class in cross-cultural communication, regarding both language and business educators. The present paper describes ITEM (Interactive Tutoring Encyclopaedia based on Multimedia), a multimedia and hypermedia application implemented in Loco[1], under UNIX, actually existing as a prototype in ToolBook[2], and running, as such, under MS-Windows[3], on PCs.

ITEM focuses on Italian economy[4] since the Unification of the country, and it fosters a discussion on how political structures, traditions, and ways of thinking affect Italian economic life.

The ITEM course covers types of economic activities, state and private roles in the economy and furthermore depicts companies with their struc-

[1] An object-oriented Prolog implemented at the UIA in the framework of an ESPRIT Project.

[2] ©Asymmetrix.

[3] ©Microsoft.

[4] We have been using the most recent study published by Mrs. J. Menet-Genty in the collection of the "études de la documentation Française": *L'économie italienne: Les paradoxes d'une réussite*, Paris, 1992.

tures, definitions, organizations, and functions. Stress is on business and professional education requiring the study of foreign cultures and languages. That is the reason why the course takes Italy as exemplary subject matter and is consequently written in specific purposes Italian. Despite it is more focused on the economic content rather than on language learning, ITEM fosters the broadening of foreign language education as long as it is applied to the needs of professional training.

Its purpose is to fill in the gap between traditionally illustrative encyclopedic knowledge, on the one hand, and the user's didactical needs to act on the data, to directly manipulate them in order to enhance learning by acquiring information in a way which best fits his/her own didactical purposes.

ITEM is therefore being designed to achieve three main goals: to serve as an instructional aid for teachers of courses covering both Italian language and basic Italian economy; to provide a self-directed learning environment for students; and to supply professionals with a research tool.

2 ITEM: Design Decisions

ITEM embodies the node-and-link model, referring back to the Dexter Hypertext Reference Model [Halasz and Schwartz, 1994]. Each node identifies an object, i.e. a module connotating some independent semantic sense. Further meanings are conveyed as a consequence of the relationships among nodes via the connecting links. Each primitive node captures an idea comprising a set of basic media objects, each representing some aspects of that idea. In an economical domain, these could be, e.g., a chart depicting the flow rate in the Milan stock market, a pictorial snapshot of a driving chain in a car factory, some paragraphs about the economic miracle in the 70s, and the audio about the FIAT president's opening speech. Every object is defined in terms of its own features. Since the overall organization is hierarchical, when common features are present, an inheritance mechanism is applied to infer them. So, for instance, a hypermedia node could be the FIAT node. It could include a short movie presenting its director, Agnelli, giving an introductory speech about his industry plus some additional textual paragraphs describing the company.

At the highest level we consider some typical information-seeking scenarios. Our starting point is to view hypermedia design as a technique to match

user requirements rather than as a collection of new technology tools. In this respect, if it is true that the main problem with hypermedia systems still remains getting lost within the hyperspace [Elm and Woods, 1985] then providing a user-centered support to navigation by modelling the user profile in respect to the task and the physical environment should bring to more effective learning.

Do you remember the somehow old idea to model the user's attitudes and preferences, goals and needs, knowledge and beliefs (see [Wahlster and Kobsa, 1989] for an overview of the field)? Well: this is exactly what Carroll [Carroll, 1994] proposes to model, but in a rather different fashion: instead of creating taxonomies of stereotyped users, in order to map the actual user onto the most suitable category, he explicitly and directly envisions and documents typical and significant user activities early and continuingly in the development process. The result is what he calls *user scenarios*, that is the view of how an individual user would engage a certain activity and would experience the resulting effects. Scenarios are vivid snapshots on the user's performance: they highlight the goals users are pursuing, the behaviour the system performs, the procedures that are adopted and that are not, the ones which are carried out successfully and the ones which are carried out erroneously. So, they also reveal users' inclinations and intentions, if the claim that behaviour is a projection of one's inner world is sustainable. They can also be used in a proactive way as long as they are being built by analogy, that is by using metaphors, even metaphors referring to theories of human activities. Carroll claims their novelty resides in the suggestion that scenarios be systematized as working design representation. They are both empirical, being based on direct observation of a task-oriented behaviour, and abstract, since they are derived from theories of human activity. Scenarios are never finalized, but they are to some degree continually developed and reinterpreted. So, they are updated, just like user profiles. But they are not as ill-defined; nor are they inconsistent or incomplete with respect to the users' needs and specifications; on the contrary, since they are organized in a function-by function manner, they are at least easy to align with the system design.

ITEM also enacts an interactive multimedia interface which is window-based, mouse-oriented, and overview-mediated. Multimediality actually implies the possibility of representing one piece of information by means of different media, be they graphics, audio, animation, video, etc. ITEM indeed covers a corpus of materials related to the Italian economic world, which

includes texts, images, and tools for using them like tools for navigation. Structured data include HTML texts, relational tables for catalogues and the encyclopaedia, Postscript drawings and TIFF images. The underlying philosophy, tracing back to ergonomics principles, is that different media impact upon the user differently, either in terms of learning facilities or of comprehension facilities, and in terms of data representation. This aspect of the problem, known as *modality allocation problem* [Brown, 1986], is the most basic condition to enhance the system friendliness in respect to the user's adaptability.

ITEM provides three user interface components, i.e. a hierarchical content list browser, a structural graphical system map, and some typographical cues like hypertextual and hypermedia links between elements in the form of navigation buttons. The content list is nothing more than a simple index as the ones printed in books, where information is given relative to the subdivision of the system into chapters. In addition here it is possible to activate via mouse a description of the selected chapter as a further device to a guided navigation. The typographical cues range from the so-called *hot-words*, i.e. words that, once selected, access new information regardless of its location within the hyperspace, to graphical icons with the same hyperfeature. The system map takes indeed the form of a block diagram, where the system structure is depicted in all its elements and in the relationships between them.

The ITEM data cycle covers data acquisition and storing, data organization, data linking, and data presentation via the UNIX front-end.

3 ITEM: Its Economic Content

In its first prototypical form, ITEM fosters a discussion on how political structures, traditions, and ways of thinking affect Italian economic life, by depicting types of economic activities, state and private roles in economy and companies with their structures, definitions, organizations, and functions. Stress is on business and professional education requiring the study of foreign cultures and languages.

¿From the point of view of its content, ITEM is organized in six different sections. The first section presents an overview of the economic development since the unification of the country in 1861. The second section introduces the

main state companies, in contrast with the third section where the biggest private groups are depicted. The fourth section deals with the financial sector, i.e. the stockmarket and its legislation, the insurances and the banks. And the fifth section defines the different forms of coorporative aggregation. Finally, a sixth section is provided where the overall navigation modalities are given. This final section is indeed conceived as a sort of appendix to be accessed only by unexperienced users.

4 ITEM: Its Approach to Language Learning

ITEM can serve as tutoring complement in language education. The purpose is not to make it a direct complement: language teaching is not its primary educational concern. This is the reason why no spelling checkers, no databases of words, no grammars have been provided. Its purpose is on the contrary to create an artificial microworld where users can manipulate only pieces of a larger whole in order to master them, to make language acquisition a passive and indirect process in order to make it as close as possible to the kind of learning occurring in natural settings, to ban tediousness and to capture users' attention and interest by engaging them in something more involving: the trick is to turn abstractions like the laws and principles of economy into new experiences that the users can access straightforwardly via the direct manipulation-based interface.

Learning turns out to be more effective not only because it is direct, nor because it is experienced, or because the user is personally involved in the process of building some form of knowledge. But because the user enjoys him/herself: it is then recognised that learning is possible only when it is founded on motivation.

Further testing will prove the extent to which our approach to language teaching is feasible and valid.

5 ITEM: What the User Can Actually Do

In its prototypical form ITEM has been designed to support two basic tasks. First, users can browse it in order to get and examine much of the primary

evidence upon which arguments about Italian economy will be based. Navigation is mainly directed in ITEM. Most links are explicit, i.e. *hardwired.* They are indeed predefined, as some kind of editorial acts, with a sort of guiding intelligence deciding which document has to lead to which other document. The reason for this is again hardware-dependent: it has to be looked at in the intrinsic limitations of the system exploited so far and it is bound to be overcome as soon as the final version in Loco will be finished.

Second, different modalities in man-machine dialogue are provided and the user's requisites and attitudes are satisfied. A user can for instance select the information in the form s/he is more familiar with, choosing among graphical, textual, or video representations of the same piece of information. S/he can access only those pieces of information fulfilling his/her immediate educational needs, adapting data acquisition to his/her personal requirements. Every user can define an interaction procedure reflecting his/her own learning patterns. And the system, at the other extreme, is conceived in a way to make it feasible for it to prompt the user's learning patterns, i.e. by encouraging the user in the development of a conceptual representation of its structure so that the user can easily navigate within hyperspace. The underlying philosophy is the idea to enhance people's experiences as a means to learn by letting them exercise the "direct agency adventure". As we have already mentioned before, the trick is to turn abstractions like the laws and principles of economy into new experiences that the users can access straightforwardly via the direct manipulation-based interface. This implies the possibility of trying out ideas with it and of getting objective results, as opposed to standard educational situations where students can only think about those ideas inside their heads without externalizing them and, moreover, without seeing the results immediately.

6 Conclusion

We have introduced what we consider a novel approach in the field of language learning and of business communication.

The project is still at an initial phase, but it promises to be worth the effort. Interactions with complex environments such as hypermedia will certainly lead to the achievement of new goals, to the assumption of new views, and to the development of new approaches.

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